Performance Evaluation of Aircraft Maintenance Staff Using a Fuzzy MCDM Approach

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Abstract. Airline companies today face formidable competitive pressure. To confront these problems and sustain competitive advantages, many companies have resorted to downsizing; this method, however, often results in the overworking of a small number of workers, especially in the case of aircraft maintenance staff, who are largely responsible for aviation safety. At the same time, during the staff annual appraisal reviews, which employ evaluation criteria that are considered equally important by most airlines, most staff members perceive themselves as underappreciated and question the fairness of the evaluation criteria. This fact influences morale and work quality, and such attitudes may possibly threaten flight safety. The aim of this research is to propose a performance evaluation model for aircraft maintenance staff, overcoming such problems by exploring the relative weights of various evaluation criteria to reflect the actual performance of workers as precisely as possible. This research takes the aircraft maintenance staff of C Airline as its case study object. A hybrid MCDM model, based on the fuzzy analytic hierarchy process (FAHP) and VisleKriterijumska Optimizacija I Kompromisno Resenje (VIKOR), is utilized to analyze the data collected from the database of C Airline. Based on the research findings, it can be concluded that for C Airline, compared with conventional evaluation criteria with equal weights, the proposed performance evaluation model for the aircraft maintenance staff not only can better assess the staff’s real performance and reward them in a more worthwhile manner but can also decrease complaints of unjust appraisals. Furthermore, according to the VIKOR analyses, taking the weights of different evaluation criteria into account can help each staff member locate the aspects of his or her work that most need improvement.

Keywords: Performance evaluation, MCDM, Airline, Fuzzy analytic hierarchy process (FAHP), VisleKriterijumska Optimizacija I Kompromisno Resenje (VIKOR)

1. Introduction. Setting aside the unique characteristics of operation capital and the skilled nature of the air transportation industry, one might say that each airline has the simple aim of providing its customers with a comfortable and safe experience while ensuring that they arrive at their desired destination on time. Of the different types of workers employed by any airline, the aircraft maintenance staff plays a critical role in helping to fulfill these aims; importantly, performance in this capacity will directly influence the